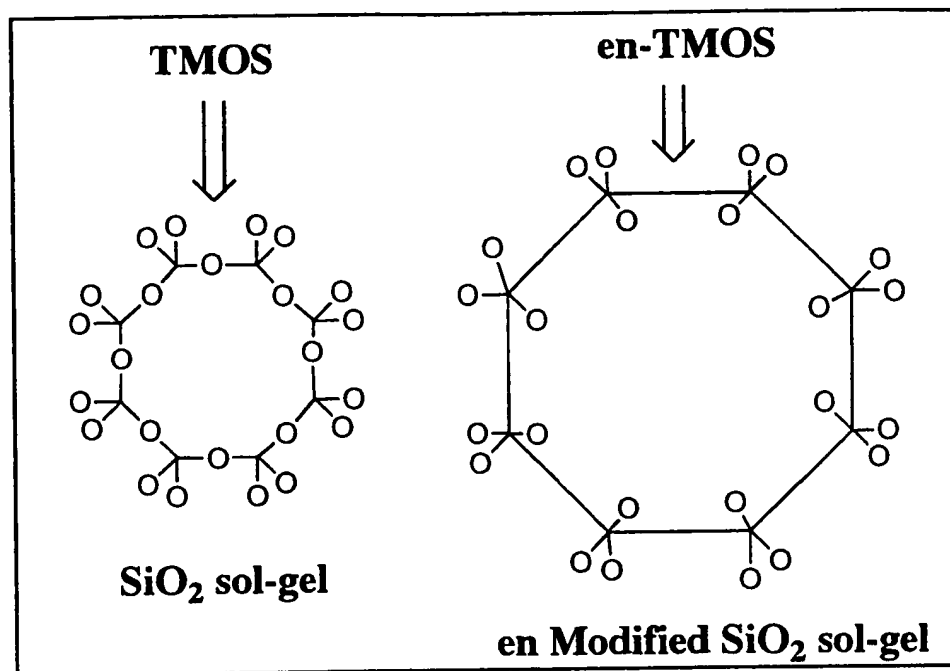
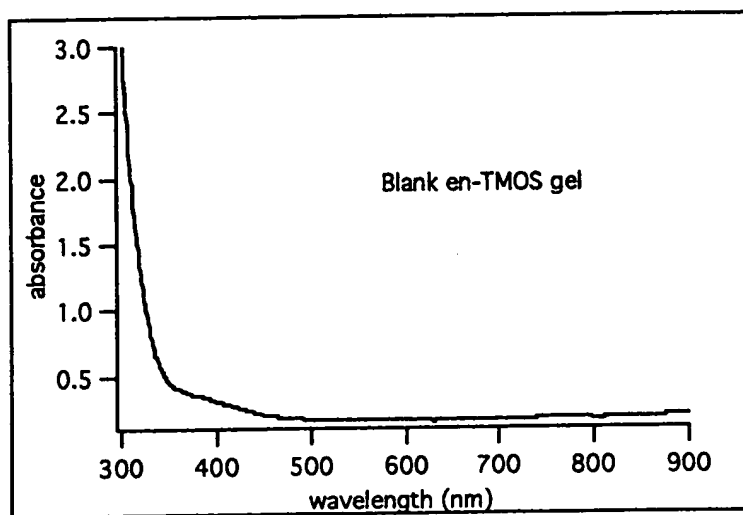


## Pore-Size Engineering



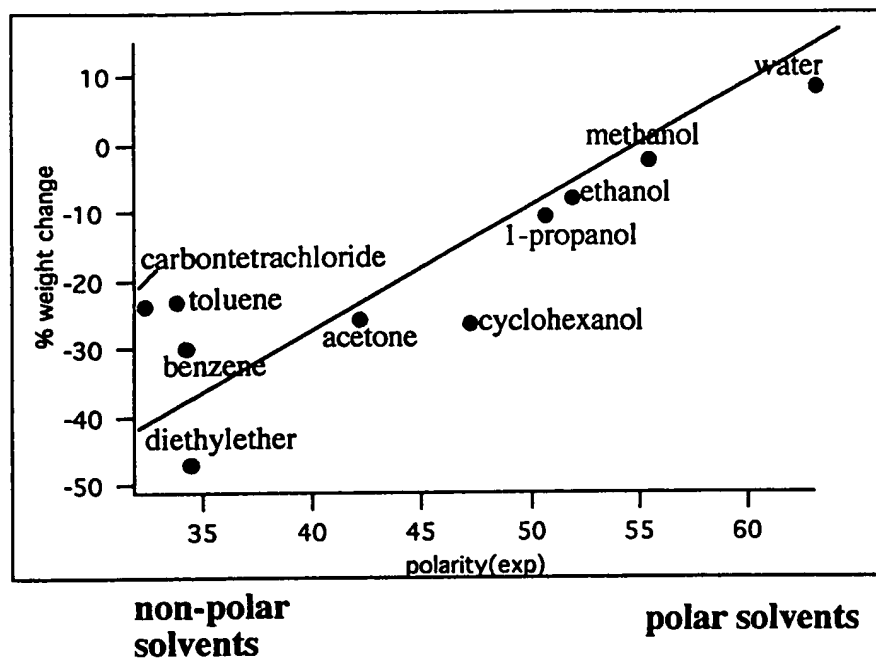
**Fig.1a** shows the enlargement of pores in the enTMOS gel in comparison to TMOS due to the inclusion of the rigid organic spacer group.



**Fig.1b** shows a tail in the yellow region  $\sim 380\text{--}400\text{nm}$  indicating the enlargement of pores.

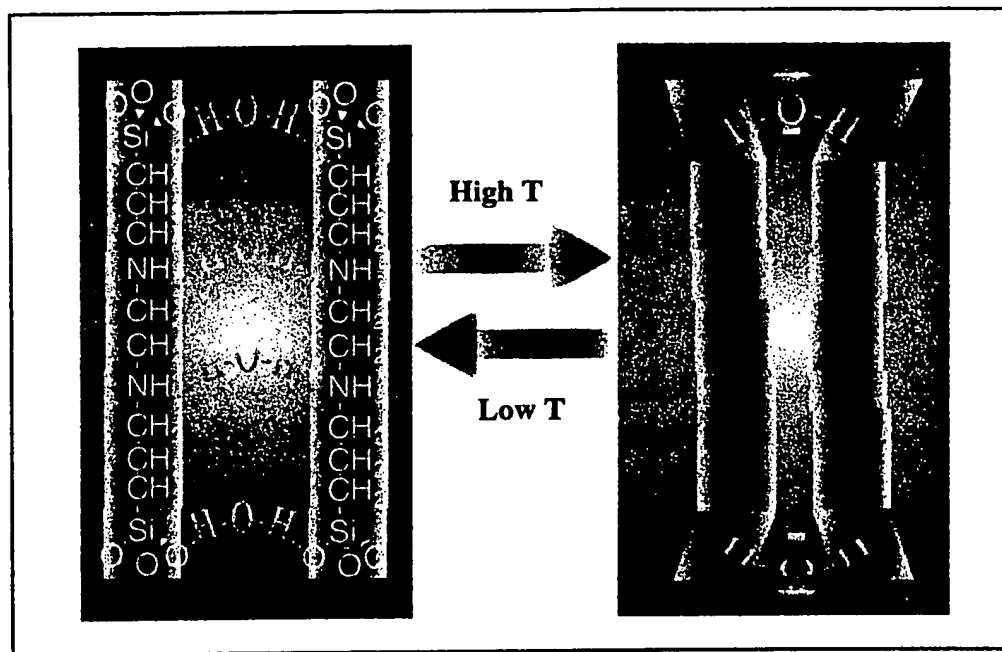
## Chemomechanical response of enTMOS gels

### Effects of solvent polarity



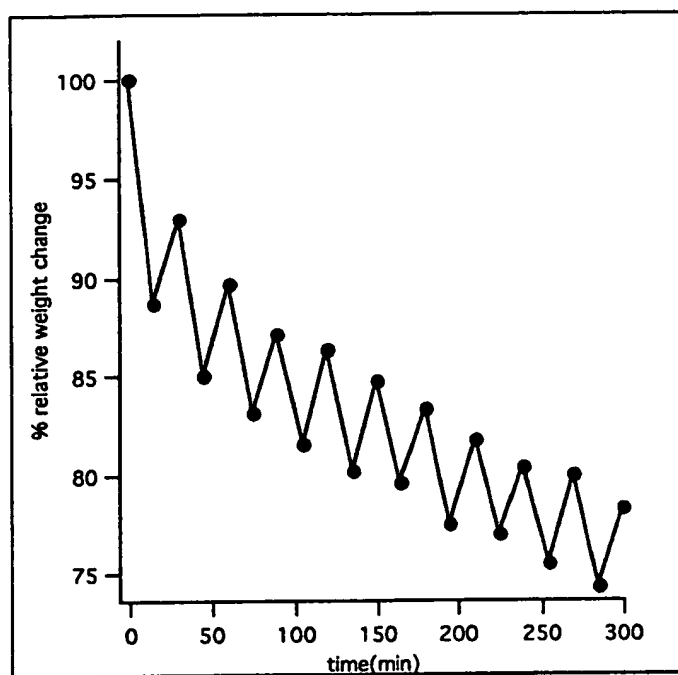
**Fig.2** shows an increased % weight change in enTMOS gel in polar solvents as compared to non polar solvents.

## Thermomechanical Response of enTMOS gels



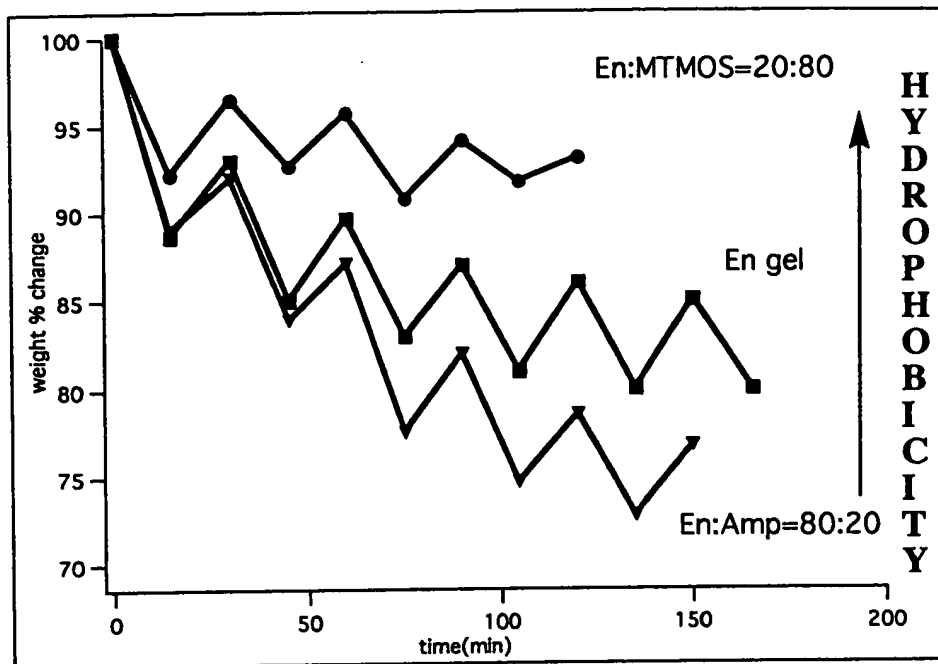
**Fig.3a** shows a reversible temperature dependent hydration-dehydration of the enTMOS gel, resulting in increased hydrophobicity at higher temperatures.

## Thermomechanical Response of enTMOS gels



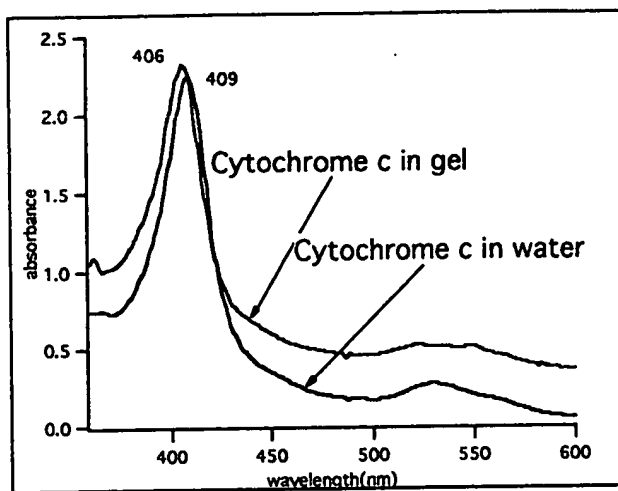
**Fig.3 b** shows a temperature dependent reversible % weight change in enTMOS gel with time.

## Thermomechanical Response Effects of Hydrophobicity/Hydrophilicity

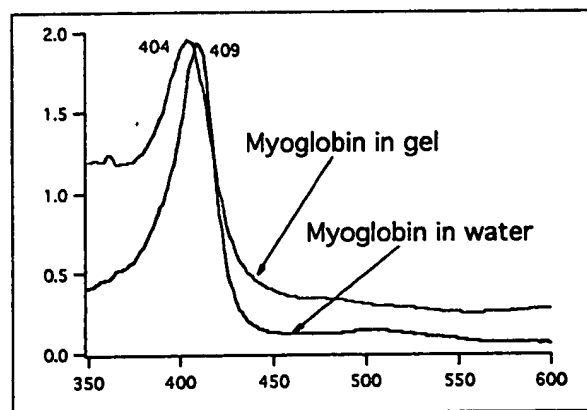


**Fig.4** shows an increased % weight change in a material with greater hydrophilic composition than enTMOS and a decreased % weight change in a material with an increased hydrophobic composition.

## Stability of Biomolecules in enTMOS gel



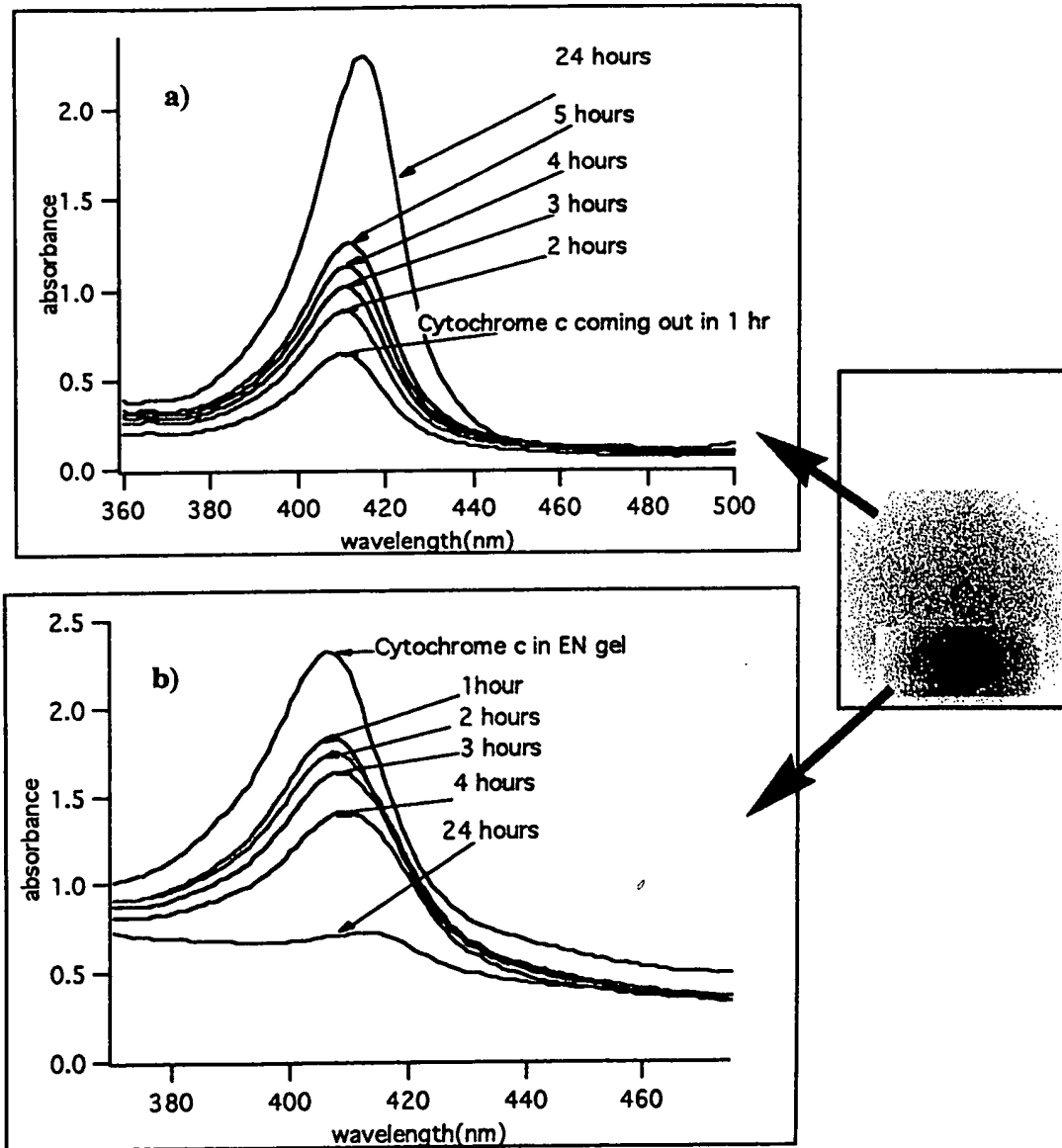
**Fig. 5a** shows the stability of Cyt c in enTMOS gel.



**Fig. 5b** shows the stability of Mb in enTMOS gel.

## Encapsulation/Release of Biomolecules by enTMOS gels

### ● Release of Cyt c



**Fig.6** a) shows the release of Cyt c with time from the enTMOS gel in acetate solution. b) shows the release of Cyt c with time from the enTMOS gel.

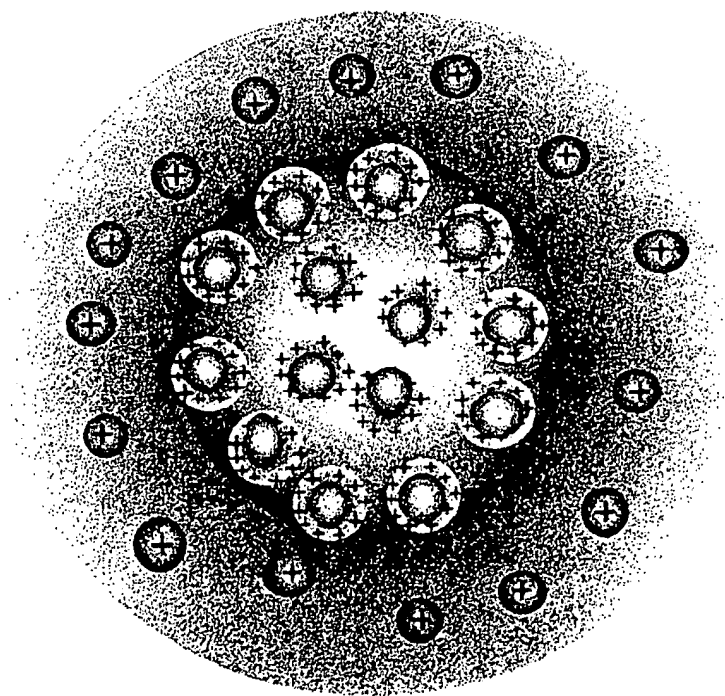
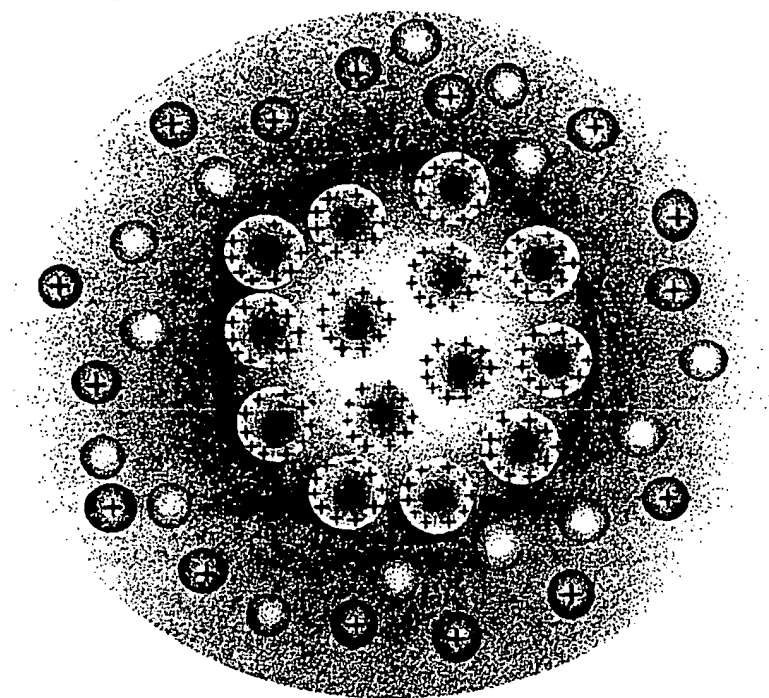


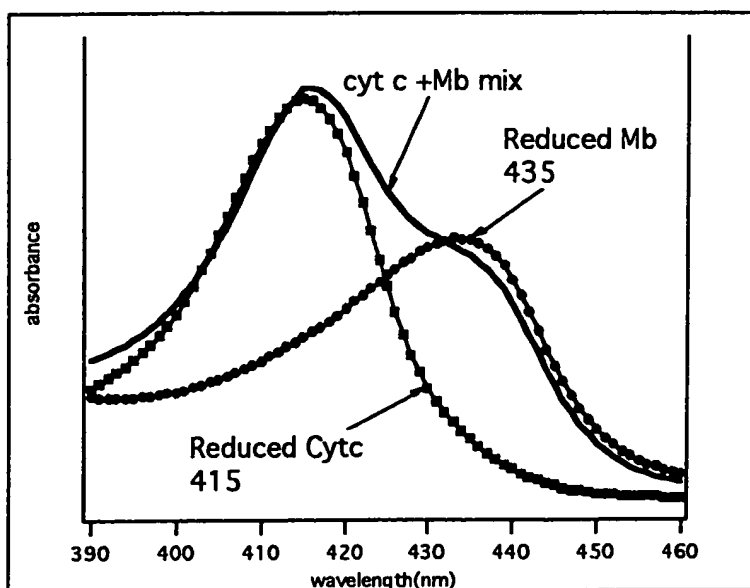
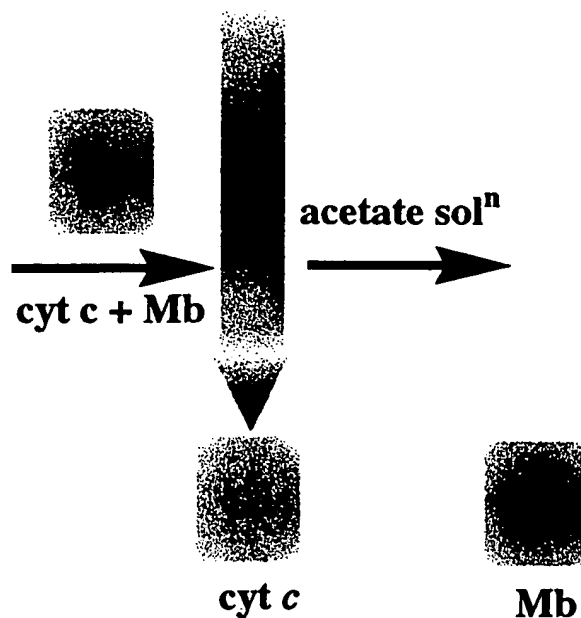
Fig.7 The positively charged enTMOS gel selectively picks up Mb or Hb(+2 charged) in comparison to Cyt c (+8 charged), from a mixture of Cyt c and Mb or Hb.

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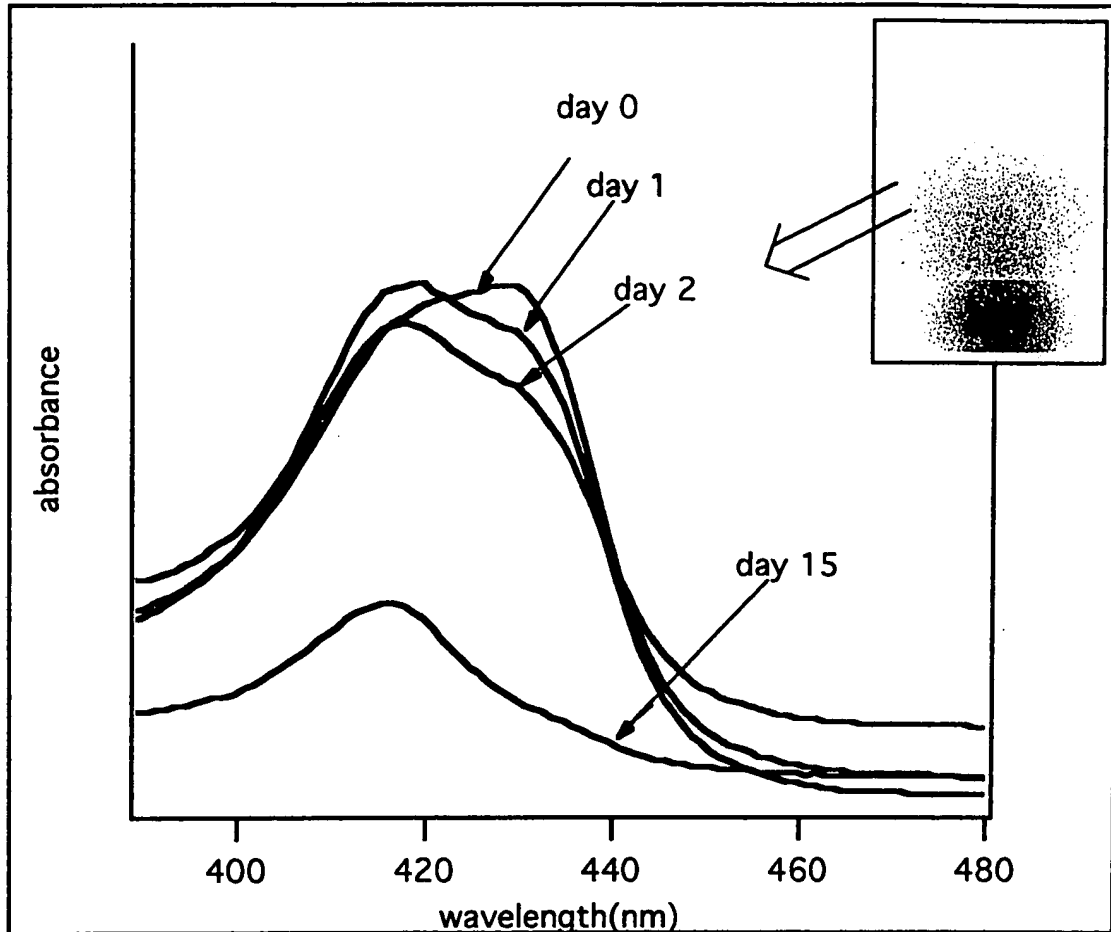
## Separation of Biomolecules by enTMOS gels

### Myoglobin and Cytochrome c



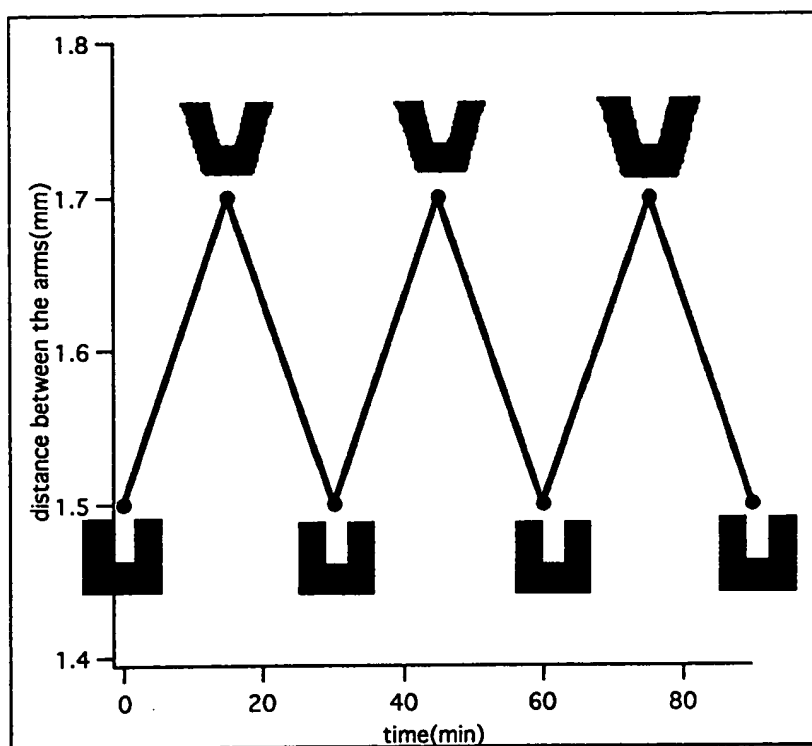
**Fig.8** The curves show the separation of Cyt c and Mb after their mixture was passed through the column containing enTMOS gel in powdered form. Cyt c comes out first, followed by Mb which is eluted with acetate solution.

## Separation of Biomolecules Hemoglobin and Cytochrome c



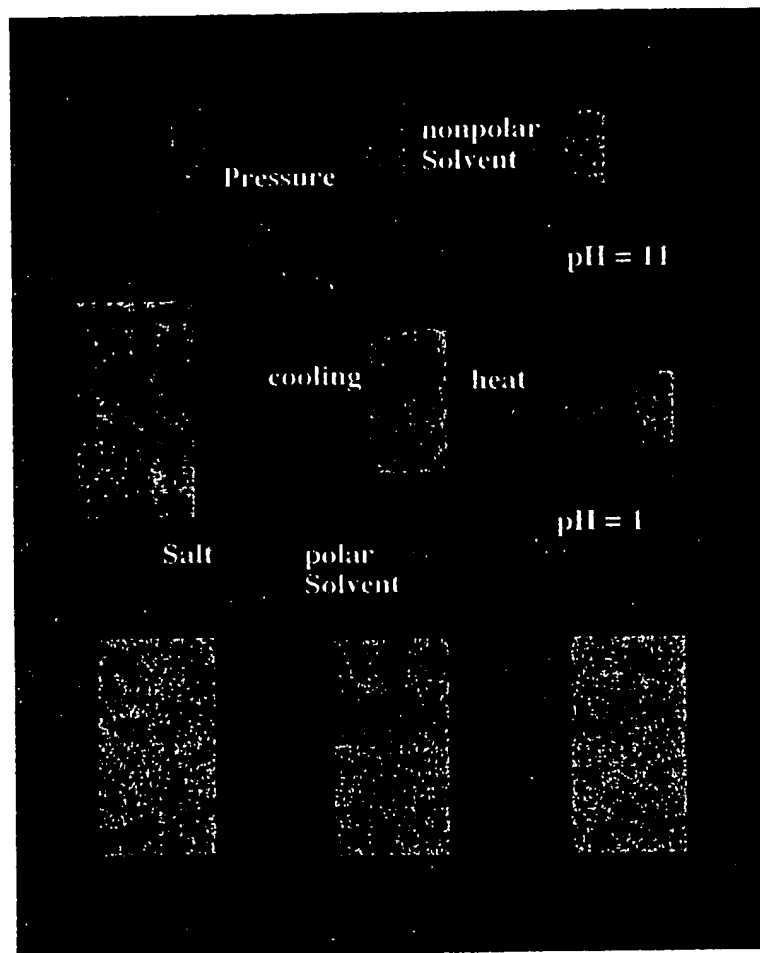
**Fig.9** Monitoring the solution of Cyt *c* and Hb in contact with the enTMOS gel shows an increase in the ratio of Cyt *c* /Hb, indicating a selective intake of Hb over Cyt *c* by enTMOS gel.

## Electromechanical response of enTMOS gels



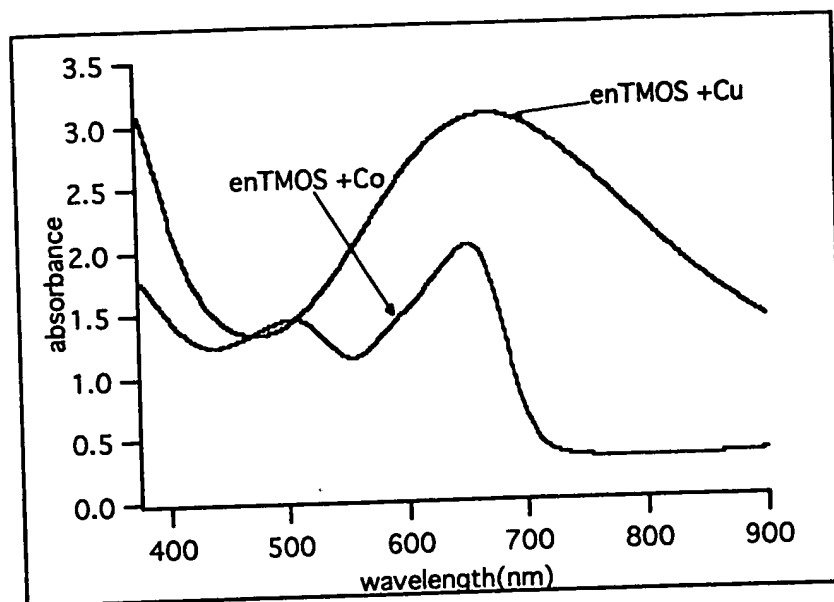
**Fig.10** shows a reversible electromechanical response of enTMOS tweezers with an applied potential of 6V.

## Influence of Environmental Stimuli on enTMOS



**Fig.11** shows the influence of various environmental stimuli on enTMOS gel.

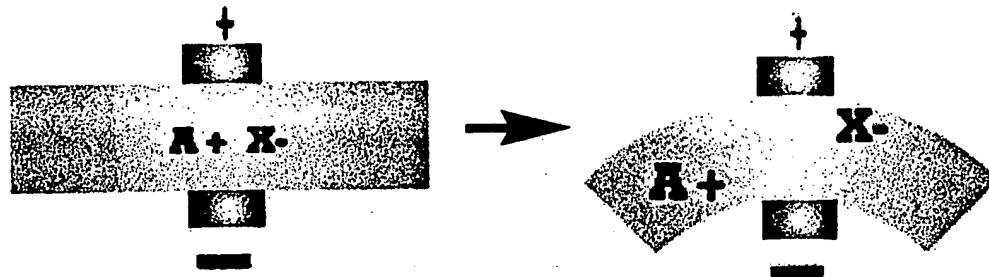
## Metal ions intake by enTMOS gel



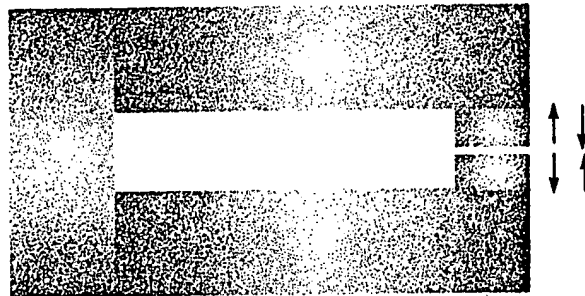
**Fig.12** shows the intake of Cu<sup>(+2)</sup> and Co<sup>(+2)</sup> ions by enTMOS gel

# enTMOS Microelectromechanical Devices

## ● Shape Memory



## ● Microtweezers



## ● Microsyringe / Micropump

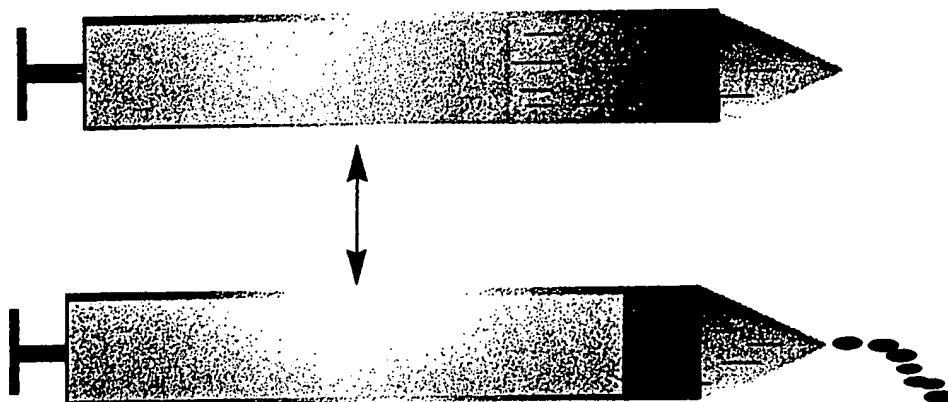


Fig.13 shows the practical devices that can be made out of enTMOS gel.